From jschreck Mon Sep 22 12:25:33 1997
From: jschreck (Jeannette Schreckenghaust)   **EXHIBIT I**
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Subject: 15-4-632.00/Airey/Visual/INVENTION DISCLOSURE FORM
Date: Mon, 22 Sep 1997 12:25:29 -0700

Hello John, Mark, Bob, Dave and Chris:

Thank you for submitting the following invention disclosure to Legal Services.
Your disclosure has been assigned docket number 15-4-632.00, and John Brigden
is the patent attorney who will review it.
Please contact John (ext. 3-3004/brigdenj@corp) or Sharon Hess, patent
paralegal (ext. 3-6522/hess@corp) if you have any questions.

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Silicon Graphics, Inc.
Invention Disclosure Form
DOCKET ID NO.: 15-4-632.00

To begin, enter your e-mail address here: airey

Then fill out items 1 through 9 below.

Item 1. Provide a short, descriptive title AND a brief (2-4 sentences)
abstract/description of your invention:

Floating Point Framebuffer

The Bali system has an innovative 16bit floating point format
available for texture store and the framebuffer. It is referred
to as the s10e5 format; sign bit, 10 bits mantissa and 5 bits
of exponent. It is of central importance to several new graphics
capabilities including programmable shading and handling images
aquired from sensors with high dynamic range or created with
photorealistic rendering techniques.

Item 2. When was the invention conceived (if you have any written evidence of
this date, please describe it and also include pointers to any on-line
evidence):

About a year ago. There is a fp.html page that is part
of the bali online documentation which describes the
s10e5 format.
I checked in a C program which detailed conversion from IEEE
32 bit floating point to the 16bit Bali format around the same
time and checked in a model of the OpenGL graphics library with
s10e5 framebuffers earlier than that. Sifting through the
Bali mail will also reveal references to s10e5.

Item 3. List all contributors to the conception of the invention (please list
the primary contact first):

John Airwy, Mark Peercy, Bob Drebin, John Montrym, Dave Dignam,
Chris Migdal, Danny Loh.

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Item 4. Has the invention been disclosed, or is it likely to be disclosed in
the near future, to people or parties outside of SGI? For example, has the
invention been described or demonstrated to a vendor, customer, or beta site;
at a technical conference or trade show; or in a printed publication? If so,
give the date and a description of each such disclosure, up to the first three,
and state whether non-disclosure agreements were used:

The innovation has been disclosed under NDA to ILM.

Item 5. Identify each SGI project or product which utilizes or may utilize the
invention. Also list the current status of each such project, including any
known or anticipated MR dates.

Bali and the programmable shading project. Both are due to MR
around 2000.

Item 6. Have there been any attempts to demonstrate, market or sell each such
product outside of SGI? (Include beta tests.)

No.

Item 7. Identify and describe any prior references which are relevant to the
invention (products, patents, publications, etc.). Provide pointers to on-line
sources.

There are software papers and reports such as those by Greg Ward
Larson (now at SGI) which detail the efforts to describe extended
range framebuffers, but I am sure tha the s10e5 format is new.

Item 8. Briefly describe the invention in the following format. Each section
need only be a paragraph or two. Provide pointers to supplemental on-line
information, if available.

PROBLEM: State the problem which motivated or required a solution provided by
your invention.

Multipass graphics algorithms, especially those implementing
shading language programs build values in the framebuffer
during computation that will typically go above 1.0 and
below 0.0.

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SOLUTION: Describe how your invention solves the problem.

The s10e5 framebuffer provides a good compromise
of range, precision and bandwidth for solving that problem.

DIFFERENTIATION: Describe how others have tried to solve the same or similar
types of problems, and how your invention differs.

There have been software algorithms that use IEEE 32bit floating
point framebuffers or shared exponent formats like the one
in the Radiance program by Greg Ward, but no hardware vendor
has provided a format with the range and flexibility of
the s10e5 format.

STRATEGIC IMPORTANCE: In a sentence or two, state why this invention is
strategically valuable to SGI. In other words, explain why SGI would care if
one of our competitors patented this technology, or why our competition would
care if SGI patented this technology. Note: A patent gives us the right to
prevent anyone else from making, using or selling the patented invention.

All future graphics will be done on floating point framebuffers.
Even today, there are many image formats derived from sensors
capable of acquiring images with extended range that the
s10e5 format is capable of handling but no other hardware
format available today can handle.

DRAWING: Please list the on-line address of at least one illustrative drawing,
screenshot, schematic, block diagram, or flowchart (rough sketches are OK):

The best solution is to look at the bali online documentation.

Item 9. Division information

Your Division: Visual Systems

Department Manager Information:

Manager's name: Dan Baum

Manager's Phone: 933-3671 and email: drb@sgi.

Item 10. Technology Classification

Technology Classification: Graphics

EXHIBIT I

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